WHAT IS CLAIMED IS:

1. A preservation mixture comprising:

a biological which is sensitive to loss of activity or viability during drying and storage at ambient or higher temperatures;

a non-reducing derivative of a monosaccharide; and

at least one additional protectant selected from the group consisting of non-reducing disaccharides, non-reducing oligosaccharides, non-reducing derivatives of disaccharides, non-reducing derivatives of oligosaccharides, proteins, polymeric protectants, and monosodium salt of glutamic acid (MSG).

2. The preservation mixture of Claim 1, wherein the biological is selected from the group consisting of sensitive biological molecules, viruses, bacteria, other prokaryotic cells, and eukaryotic cells.

3. The preservation mixture of Claim 1, wherein the preservation mixture has a total solute mass, and wherein the modified non-reducing derivative of a monosaccharide comprises between about 5% and 80% wt% of the total solute mass.

4. The preservation mixture of Claim 1, wherein the modified non-reducing derivative of a monosaccharide comprises between about 20% and 60% wt% of the total solute mass.

5. The preservation mixture of Claim 1, wherein the modified non-reducing derivative of a monosaccharide is a methylated monosaccharide.

6. The preservation mixture of Claim 5, wherein the methylated monosaccharide is methyl α-glucopyranoside or methyl β-glucopyranoside.

7. The preservation mixture of Claim 1, wherein the non-reducing disaccharide is sucrose or trehalose.

8. The preservation mixture of Claim 1, wherein the protein is selected from the group consisting of gelatin, albumin, whey albumin or globulin, and a stress protein.

9. The preservation mixture of Claim 1, wherein the polymeric protectant is HES, PVP, cyclodextrin and PEG.

10. The preservation mixture of Claim 1, wherein the protein can be any protein which is stable in aqueous medium at a temperature of greater than about 50° C, and at a pH of greater than about 9 or less than about 5.

11. The preservation mixture of Claim 1, wherein the protein concentration is greater than about 3 wt.%.

12. The preservation mixture of Claim 11, wherein the protein concentration is greater than about 10 wt.%.

13. The preservation mixture of Claim 1, wherein the preservation mixture has a total solute mass, and wherein the MSG comprises between about 5% and 80% wt% of the total solute mass.

14. The preservation mixture of Claim 13, wherein the MSG comprises between about 20% and 60% wt% of the total solute mass.

15. The preservation mixture of Claim 1, wherein the preservation mixture has a total solute mass, and wherein the non-reducing disaccharide comprises between about 5% and 80% wt% of the total solute mass.

16. The preservation mixture of Claim 15, wherein the non-reducing disaccharide comprises between about 20% and 60% wt% of the total solute mass.

17. The preservation mixture of Claim 1, wherein the preservation mixture has a total solute mass, and wherein the non-reducing oligosaccharide comprises between about 5% and 80% wt% of the total solute mass.

18. The preservation mixture of Claim 17, wherein the non-reducing oligosaccharide comprises between about 20% and 60% wt% of the total solute mass.

19. The preservation mixture of Claim 1, wherein the oligosaccharide is not raffinose.

20. The preservation mixture of Claim 1, wherein the preservation mixture is formulated so that it will not crystallize during drying and subsequent storage for at least two weeks.

21. A method of preserving a biological which is sensitive to loss of activity or viability during drying and storage at ambient or higher temperatures, the method comprising:

mixing the biological with a protectant comprising a modified non-reducing derivative of a monosaccharide and at least one additional compound selected from the group consisting of non-reducing disaccharides, non-reducing oligosaccharides, non-reducing derivatives of disaccharides, non-reducing derivatives of oligosaccharides, proteins, polymeric protectants, and monosodium salt of glutamic acid (MSG) to form a preservation mixture; and

drying the preservation mixture, wherein at least a portion of the activity or viability of the biological is retained during the drying process and during subsequent storage at ambient or higher storage temperatures.

22. The method of Claim 21, wherein the biological is selected from the group consisting of viruses, bacteria, other prokaryotic cells, and eukaryotic cells.

23. The method of Claim 21, wherein drying is conducted by freeze-drying, desiccation, spray-drying, fluidized bed drying, drying in a vacuum, drying in a dry atmosphere, and drying by foam formation.

24. The method of Claim 21, wherein the preservation mixture has a total solute mass, and wherein the modified non-reducing derivative of a monosaccharide comprises between about 5% and 80% wt% of the total solute mass.

25. The method of Claim 24, wherein the modified non-reducing derivative of a monosaccharide comprises between about 20% and 60% wt% of the total solute mass.

26. The method of Claim 21, wherein the modified non-reducing derivative of a monosaccharide is a methylated monosaccharide.

27. The method of Claim 26, wherein the methylated monosaccharide is methyl α-glucopyranoside or methyl β-glucopyranoside.

28. The method of Claim 21, wherein the non-reducing disaccharide is sucrose or trehalose.

29. The method of Claim 21, wherein the protein is selected from the group consisting of gelatin, albumin, whey albumin or globulin, and a stress protein.

30. The method of Claim 21, wherein the polymeric protectant is HES, PVP, cyclodextrin and PEG.

31. The method of Claim 21, wherein the protein can be any protein which is stable in aqueous medium at a temperature of greater than about 50° C, and at a pH of greater than about 9 or less than about 5.

32. The method of Claim 21, wherein the protein concentration is greater than about 3 wt.%.

33. The method of Claim 32, wherein the protein concentration is greater than about 10 wt.%.

34. The method of Claim 21, wherein the preservation mixture has a total solute mass, and wherein the MSG comprises between about 5% and 80% wt% of the total solute mass.

35. The method of Claim 34, wherein the MSG comprises between about 20% and 60% wt% of the total solute mass.

36. The method of Claim 21, wherein the preservation mixture has a total solute mass, and wherein the non-reducing disaccharide comprises between about 5% and 80% wt% of the total solute mass.

37. The method of Claim 36, wherein the non-reducing disaccharide comprises between about 20% and 60% wt% of the total solute mass.

38. The method of Claim 21, wherein the preservation mixture has a total solute mass, and wherein the non-reducing oligosaccharide comprises between about 5% and 80% wt% of the total solute mass.

39. The method of Claim 38, wherein the non-reducing oligosaccharide comprises between about 20% and 60% wt% of the total solute mass.

40. The method of Claim 21, wherein the oligosaccharide is not raffinose.

41. The method of Claim 21, wherein the preservation mixture is formulated so that it will not crystallize during drying and subsequent storage for at least two weeks.

42. The method of Claim 21, wherein the modified non-reducing derivative of a monosaccharide is methyl (α or β) glucose and the at least one additional compound is sucrose, and wherein the ratio of sucrose to methyl (α or β) glucose is between about 4:1 to about 1:2.

43. The method of Claim 21, wherein the at least one additional compound includes sucrose and MSG, and wherein the ratio of sucrose to MSG is between about 10:1 to about 1:4.

44. The method of Claim 22, wherein mixing further comprises at least two steps including loading the virus or cell with the non-reducing derivative of a monosaccharide and then adding the at least one additional compounds to form the preservation mixture.

45. The method of Claim 44, wherein loading is achieved by equilibration of the biological in a solution containing the non-reducing derivative of a monosaccharide.